In the Drawings:

Kindly replace sheet 1 of the drawings with Replacement Sheet 1. A copy of Replacement Sheet is attached.

REMARKS

Claims 1, 3-17, and 25-31 were pending and presented for examination and in this application. In an Office Action dated June 8, 2006, claims 1, 3-17, and 25-31 were rejected. Applicants thank Examiner for examination of the claims pending in this application as well as the interview granted on August 28, 2006. The Interview Summary filed August 29, 2006, includes a summary of the interview and the Remarks herein further incorporate the substance of that interview.

Applicants have amended FIG. 1A (Replacement Sheet) to label the previously shown angles as a, b, and c. In addition, the drawing shows the exit surface 115 of the lens 135 to be curvatured. Support for these changes is found in the specification, for example, in paragraphs 0024 to 0034. Further, Applicants have amended the specification at paragraphs 0024 and 0028 to reflect the labeled angles a, b, and c in the Replacement Sheet.

Applicants are amending claims 1, 9-12, 25, and 27-31 in this Amendment and Response. In making these amendments, Applicants have not and do not concede that the subject matter of such claims was in fact disclosed or taught by the cited prior art. Rather, Applicants reserve the right to pursue such protection at a later point in time and merely seeks to pursue protection for the subject matter presented in this submission.

In view of the Amendments herein and the Remarks that follow, Applicants respectfully request that Examiner reconsider all outstanding objections and rejections, and withdraw them.

Objection to the Drawings

Examiner has objected to the drawings stating they must show every feature of the invention specified in the claims 1, 25, and 27. Applicants are enclosing a Replacement

Sheet of FIG. 1A to now obviate the basis for this rejection. As described herein, no new matter has been added with the introduction of this Replacement Sheet.

Representative example claim 1 has been amended and now recites an optical system that includes, *inter alia*, the following:

> . . .
>
> a lens having an entrance surface and an exit surface, the entrance surface positioned to gather the light from the light source and the exit surface directing the light onto the target surface, the entrance surface structured with a curvature to refractively shape the gathered light and angled at a second angle different than the first angle to refract the gathered light towards the exit surface, the exit surface structured with a curvature to further refractively shape the gathered light and angled at a third angle different from the second angle to refract the gathered light to illuminate the target surface, the lens further configured to traverse light between the entrance surface and exit surface without total internal reflection.

As structured, the lens receives a light from a light source at a first angle. The lens is structured with an entrance surface having a curvature that is used to initially shape the light from the light source. In addition, it is angled at a second angle different from the first angle to defracts the light towards an exit surface of the lens. Further, the exit surface is structured to include a curvature to further shape the light and is angled at a third angle that is different than the second angle to refract the light to a target surface. The lens is further configured so that the light traverses between the entrance surface and exit surface, as recited, without total internal reflection.

Support for the claim can be found in the Replacement Sheet. Support for the amendment in the Replacement Sheet can be found in the specification at, for example, paragraphs 0024 to 0034 and FIG. 1A as filed. Specifically, the specification notes that the entrance surface of the lens is curvatured and in one embodiment can be aspherical in shape.

(Specification, paragraph 0026). Likewise, the exit surface also is curvatured. (Id., paragraph 0027). In addition, the drawings and specification illustrate and describe the angles between the light source, entrance surface, and exit surface relative to the printed circuit board. Additional support for these features also is found in paragraph 0028. (Id., FIG. 1A; paragraphs 0026-0028). In addition, Applicants have amended paragraphs 0024 and 0028 to reflect the explicit notation of angles a, b, and c in the Replacement Sheet for FIG. 1A.

In view of the amendments herein and the noted support in the drawings and specification, Applicants request reconsideration and withdrawal of the rejection.

Response to Rejection Under 35 USC § 112, Paragraph 1

In the 3rd paragraph of the Office action, Examiner has rejected claims 1, 3-17, and 25-31 under 35 USC § 112, ¶ 1 as allegedly lacking written description. This rejection is now traversed.

As noted previously, representative example claim 1 has been amended and now recites, *inter alia*, an optical system within a computer mouse that comprises:

> a light source, positioned at a first angle relative to a circuit board, the light source configured for emitting light to illuminate the target surface, the first angle being non-perpendicular to the circuit board; and
>
> a lens having an entrance surface and an exit surface, the entrance surface positioned to gather the light from the light source and the exit surface directing the light onto the target surface, the entrance surface structured with a curvature to refractively shape the gathered light and angled at a second angle different than the first angle to refract the gathered light towards the exit surface, the exit surface structured with a curvature to further refractively shape the gathered light and angled at a third angle different from the second angle to refract the gathered light to illuminate the target surface, the lens further configured to

> traverse light between the entrance surface and exit surface without total internal reflection.

Support for the claimed invention is found in the drawings and specification at, for example, Figure 1A and paragraphs 0024 to 0034.

By way of example, the specification notes "a light source 100, the lens 135 having an entrance surface 110 and an exit surface 115, a printed circuit board 105, a target area (or a concentration spot 120 on a surface and an imaging lens 125. In one embodiment, the light source 100 may protrude through an opening in the printed circuit board ("PCB") 105." (Specification, paragraph 0024). Further, the specification notes that "[l]ight emitted from the light source 100 enters the lens 135 through the entrance surface 110. The light exiting the exit surface 115 of the lens 135 forms a light beam 130 and is directed to a surface at the target area 120." (Id., paragraph 0024).

As for the lens entrance and exit surface, the specification discloses:

> entrance surface 110 of the lens 135 is curvatured. In one embodiment, the entrance surface 110 can be aspherical in shape to collect as much light as possible. In another embodiment, the entrance surface 110 of the illumination lens 135 can be matched with a shape of the LED tip so that a continuous media without changes of refractive index will result. The exit surface 115 bends the light such that it has the desired angle and focuses the light to produce an illumination spot on the target area that is as uniform as possible on the surface. In one embodiment, the exit surface or the entrance surface can be ground to diffuse the light making it more uniform on the target area 120.

(Specification, paragraph 0026). Furthermore, the specification discloses:

> The entrance surface 110 and the exit surface 115 each refract light. By adjusting the shape of both or either the entrance surface 110 or the exit surface 115, the light beam emerging from the lens 135 can be shaped or tilted as needed.

(Specification, paragraph 0028). In view of the amendments herein and the above remarks pointing to the drawings and specification, Applicants respectfully submit that the claims are fully supported by the specification as filed. Applicants request reconsideration and withdrawal of the basis for the rejection to claims 1, 3-17, and 25-31.

Response to Rejection Under 35 USC 103(a) in View of Adan and Kleinschmidt

In the 4th paragraph of the Office action, Examiner rejects claims 1, 4-7, 9-15, and 25-31 under 35 USC § 103(a) as allegedly being unpatentable in view of U.S. Patent No. 6,531,692 ("Adan") in view of U.S. Patent No. 6,476,987 ("Kleinschmidt"). This rejection is respectfully traversed.

Claim 1 has been amended as noted above. As amended, the claim recites a system that includes a lens that receives light from a light source at a first angle. The lens is structured with an entrance surface having a curvature that is used to initially shape the light from the light source. In addition, it is angled at a second angle different from the first angle to defracts the light towards an exit surface of the lens. Further, the exit surface is structured to include a curvature to further shape the light and is angled at a third angle that is different than the second angle to refract the light to a target surface. The lens is further configured so that the light traverses between the entrance surface and exit surface, as recited, without total internal reflection. This claimed configuration provides an efficient lens configuration for use in confined, small volume spaces, for example, in computer optical mice. Moreover, the shaping and refraction features allow greater structural tolerances that help eliminate positioning errors.

The references cited, Adan and Kleinschmidt, do not disclose the claimed invention, either alone or in combination. As noted in prior Responses by Applicants, there are

fundamental differences between the system in Adan versus the claimed invention. For example, the system in Adan uses a lens that relies on a total internal reflection (TIR) configuration to manipulate light from a light source for illuminating a surface. (Adan, FIG. 5). Moreover, the curvature on the entrance and exit surfaces of the lens is not configured for beam shaping. With reference to Figure 5 of Adan, it illustrates internal reflection pattern of light as it passes down the straight path of the optical coupler 107. (Adan, FIG. 5). In particular, Adan states that "[l]ight conducting portion 146 acts to conduct the collected light which enters through inlet end 142 axially along lens 107 to outlet end 144." (Adan, col. 11, lines 24-26). The optical coupler 107 in Adan relies on a total internal reflection technique to move light down towards the outlet end 144 for passage through the aperture 106.

Next, to implement this reflective system, the system in Adan must be structured to allow light to pass along a straight path. Referring to Figures 5, 6, and 7C of Adan, the system is configured to have light travel straight through from the light source to the illumination surface. There is a lack of angles with respect to the structures through which light traverses the system as Applicants' claim recites. Specifically, as shown in Figure 6, the light source 104 emits light straight into an inlet end 142, straight through an optical coupler 107, out an outlet end 144, straight out the aperture 106, and onto the surface. (Adan, FIG. 6).

Moreover, the specification of Adan emphasizes the straight, aligned path of the components of the system. Specifically, Adan recites "it is important that optical coupler 107 and source 104 be well aligned with one another[;] [s]imilarly, it is important that outlet end 144 be well aligned with aperture 106." (Adan, col. 11, lines 53-57). Further, Adan emphasizes that "the central portion 146 of optical coupler 107 has a length which is

sufficient to remove radiation source 104 from aperture 106 by an amount which reduces the likelihood that electrostatic discharge will reach any exposed leads or wires within housing 102." (Adan, Abstract, col. 11, lines 40-45). Hence, by purposeful design, Adan relies on a long straight light path using in an elongated structure, which differs from the compact structure provided by the claimed invention.

Nor would Kleinschmidt rectify the deficiencies of Adan. Kleinschmidt is directed to "prism configurations for line-narrowing resonators of excimer or molecular fluorine laser systems beams having at desired spectral bandwidths." (Kleinschmidt, col. 1, lines 10-13). The configuration in Kleimschmidt appears to be a conventional prism for use with a very specific laser system having very specific operational requirements. (Kleinschmidt, col. 4, line 23 to col. 5, line 3; FIG. 2). One immediate deficiency with Kleinschmidt is that it has no entrance or exit surfaces with curvatures. Further, there is no disclosure, teaching, or suggestion as to why or how the prism in Kleinschimidt should be or could be used with the optical pointing device system in Adan or vice versa. In fact the prism in Kleinschmidt could not simply be dropped into the system disclosed by Adan; rather, there would need to be a significant structural reconfiguration of the device because of Adan's high precision alignment and additional optical properties that Kleinschmidt does not address.

Thus, for at least the reasons set forth above, claim 1 is distinguishable over the combination of Adan and Kleinschmidt. Further, the analysis set forth above also is applicable to the dependencies of claim 1, as well as independent claims 25, 27, and 32 and their respective dependencies. Therefore, Applicants respectfully request reconsideration and withdrawl of the basis of the rejection to all these claims and allowance of them at this time.

Conclusion

In sum, Applicants respectfully submit that claims 1, 3-17, and 25-31, as presented herein, are patentably distinguishable over the cited references (including references cited, but not applied). Therefore, Applicants request reconsideration of the basis for the rejections to these claims and request allowance of them.

In addition, Applicants respectfully invite Examiner to contact Applicants' representative at the number provided below if Examiner believes it will help expedite furtherance of this application.

Respectfully Submitted,
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